

**CLAIMS**

**We claim:**

1. A mixer topology configured to reduce predetermined spurious output signals, the mixer topology comprising:

an input coupler having an input port and two output ports, said input port configured with predetermined phase shifts between said input port and said two output ports;

a local oscillator (LO) coupler having an input port and two output ports, said LO coupler configured with predetermined phase shifts between said input port and said two output ports;

an intermediate frequency (IF) coupler with two input ports and output port, said IF coupler configured with predetermined phase shifts between said two input ports and said output port;

a first mixer having two input ports and an output port, said input ports each electronically coupled to one of said two input ports of said input coupler and said LO coupler, said output port electrically coupled to one of said two input ports of said IF coupler; and

a second mixer having two input ports and an output port, said input ports each electrically coupled to the other of said two input ports of said input coupler and said LO coupler, said output port electrically coupled to the other of said two input ports of said IF coupler, wherein said input coupler, LO coupler and IF coupler are configured to cancel the and one or more other preselected spurs other than the (1, 1) spur.

2. The mixer topology as recited in claim 1, wherein said predetermined phase shifts of said input coupler include a 180° phase shift.

3. The mixer topology as recited in claim 1, wherein said predetermined phase shifts of said LO coupler include a 180° phase shift.

4. The mixer topology as recited in claim 1, wherein said predetermined phase shifts of said IF coupler include a 180° phase shift.

5. The mixer topology as recited in claim 1, wherein said one or more other preselected spurs include the (2, 0) spur.

6. The mixer topology as recited in claim 1, wherein said one or more other preselected spurs include the (0, 2) spur.

7. The mixer topology as recited in claim 1, wherein said one or more other preselected spurs include the (2, 1) spur.

8. The mixer topology as recited in claim 1, wherein said one or more other preselected spurs include the (2, 2) spur.

9. The mixer topology as recited in claim 1, wherein said one or more other preselected spurs include the (1, 2) spur.

10. The mixer topology as recited in claim 1, wherein said one or more other preselected spurs include the (1, 3) spur.

11. A mixer topology configured to reduce preselected spurious output signals, the mixer topology comprising:

a pair of mixers, each mixer having a pair of input ports and an output port, said output ports electrically coupled together; and

means for phase shifting preselected output signals at said output ports to cause preselected spurs to cancel.

12. The mixer topology as recited in claim 11, wherein said phase shifting means includes a plurality of couplers said couplers, configured to cause phase shifting of preselected output signals of said mixers.

13. The mixer topology as recited in claim 12, wherein said mixer topology includes an IF coupler for coupling the output signals from said pair of mixers.

14. The mixer topology as recited in claim 13, wherein said IF coupler is configured with a phase shift between one of the two input ports and the output port of  $0^\circ$ .

15. The mixer topology as recited in claim 14, wherein said IF coupler is configured with a phase shift between the other of the two input ports and the output port of  $0^\circ$ .

16. The mixer topology as recited in claim 14, wherein said IF coupler is configured with a phase shift between the other of the two input ports and the output port of  $180^\circ$ .

17. The mixer topology as recited in claim 12, wherein said phase shifting means includes an input coupler having an input port and two output ports, said output ports electrically coupled to one of said two input ports of each of said pair of mixers.

18. The mixer topology as recited in claim 17, wherein said input coupler is configured with a phase shift between one of the two input ports and the output port of  $0^\circ$ .

19. The mixer topology as recited in claim 18, wherein said input coupler is configured with a phase shift between the other of the two input ports and the output port is  $0^\circ$ .

20. The mixer topology as recited in claim 18, wherein said input coupler is configured with a phase shift between the other of the two input ports and the output port is  $180^\circ$ .

21. The mixer topology as recited in claim 12, wherein said phase shifting means includes a local oscillator (LO) coupler having an input port and two output ports, said output ports electrically coupled to one of said two input ports of each of said pair of mixers.

